

Curbing Illegal Grazing Through Mediating Interests of Local Communities in East Nusa Tenggara Province, Indonesia

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Abstract

Communities living in the surrounding forest have used the state forest for grazing areas in East Nusa Tenggara Province, Indonesia for a long time. However, Indonesia government has not given them a permit for managing state forests. Recently, Indonesia government attempted to involve communities in state forest management to curb illegal grazing and generate people income but the government, as a principal, was worried that the communities, as agents, will act in a way contrary to the interest of the government. We used a principal agent theory to analyze principal agent problems which will occur if communities manage state forest for silvopasture purposes. The research showed that there are some principal agent problems in silvopasture contract if government give communities a permit for silvopasture purpose, i.e. communities, as agents, are not willing to plant trees and keep forest. Government must control communities to prevent some principal-agent problems in silvopasture contracts.

Keywords

community; forest; principal agent problem: silvopasture

INTRODUCTION

Communities have used state forests for grazing areas especially in East Nusa Tenggara Province (Kurniadi, 2017). They have managed forests before the government determined the grazing area as state forest. Indonesia government didn't allow communities to use forests as grazing areas because the government feared whether communities manage unsustainably forest.

Indonesia government is increasingly seeking strategies to improve forests by involving local people. They launch a policy that leads communities to manage state forests and make some programs to generate income for people living surrounding fo-

rests. Indonesia government launched a rapid land reform policy which targets about 12% of the country's land area for redistribution to farmers and communities by 2019 (Resosudarmo *et al.*, 2019). Government will contract with people or a wide range of agencies to manage state forests (Kurniadi, 2017) and give the community an obligation to preserve the forest.

Indonesian government issued a policy that allows communities to manage forests for silvopasture since 2015. However,

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Indonesian government has not yet provided a silvopasture area in East Nusa Tenggara Province because they are worried that the communities manage unsustainably the forest. Government don't understand behavior of communities, as agent and they manage forest without communities.

Government will involve communities in silvopasture management in state forest. Relationship between government and communities are principal-agent relationship. Government as a principal, grant communities a right to manage state forest and communities, as agent, must fulfill interest of government. However there are principal-agent problems if government grant communities a right for managing state forest (Zubair et al 2014). Principal-agent problem with moral hazard occurs in principal agent relationship when a principal or agent may use their private information at the expense of the party who may be less informed (Roch, 2016). Furthermore, forests are degraded because principal agent problems with moral hazard occur.

METHODS

Principal agent theory (Jensen and Meckling, 2012) was used to analyze some problems in principal-agent relationship, between government, as a principal, and community, as agent, in silvopasture management. Government, as principal, aims to conserve forest and communities, as agent, aim to graze livestock in the forest. Government will involve the communities in forest management and give community a license for managing forest as a silvopasture area. In the research, we analyzed some problems which occur if government give people license for managing state forest.

Indonesia government manage state forest to get environmental benefit but some forest areas were used illegally by community as grazing area. The government is seeking strategies for improving state forest and involving communities. However government is worried that they

face some problems if they involve communities in managing state forest. The Principal Agent Problem occurs when one person (the agent) is allowed to make decisions on behalf of another person (the principal). In this situation, there are issues of moral hazard and conflicts of interest (Jensen and Meckling, 2012).

Relationship between government and communities are principal agent relationship. Government, as a principal, offers a contract to communities, as an agent, for a joint project. Under this arrangement, the agent is to take an action which the principal cannot observe. The principal does, however, observe the outcome of the action as a consequence of the agent's behavior (Jost, 1991). The research observe agent's behavior which will happen when government contract with agent for managing forest.

Survey Method

A survey of silvopasture contract was conducted in Timor Tengah Utara (TTU) Regency, East Nusa Tenggara Province, Indonesia during June and July of 2019 (Figure 1). The survey was aimed at eliciting information about behavior of communities if government contract with communities for silvopasture management.

A purposive sampling was used to choose some respondents related to state forest management. Respondents are grazers and we interviewed them on the farms or their home. In total, we interviewed 18 grazers. Moreover, we explored the interest of Timor Tengah Utara regency government through interviewing employee of forestry service of Timor Tengah Utara regency government and gathered data from document.

We analyzed descriptively data of behavior of respondent and related principal-agent problems. We intend to solve the principal-agent problems and explore some strategies for involving community in silvopasture management. We discovered reasons of principal-agent problems.

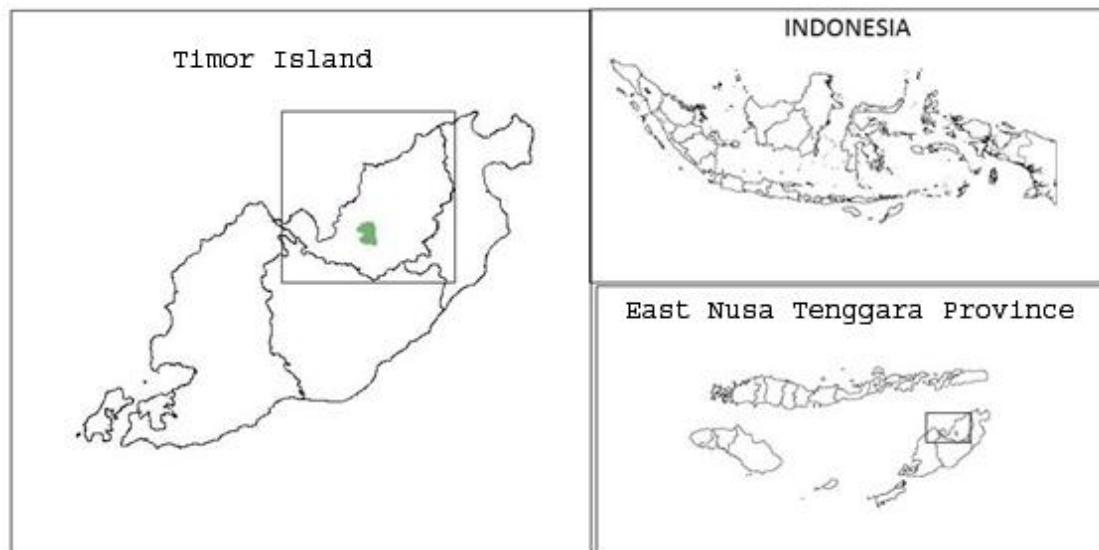


Figure 1. Map of Timor Tengah Utara Regency

RESULT AND DISCUSSION

Silvopasture Policy

There are suitable forests for silvopasture in Timor Island because the forest contains grass which can be utilized for fodder. The research was conducted in Timor island which has low rainfall and the forest contains grass. In addition, communities living surrounding forest utilized the forest as grazing area.

Indonesia government launched a new policy related silvopasture since 2015. Government launched a policy which involve communities in silvopasture management in state forest area. Ministry environment and forestry of Indonesia issued a rule number P.14/menlhk-II/2015 which give a chance for communities to manage forest for silvopasture purpose. Government can give communities a permit for silvopasture purpose and communities can graze their livestock in the forest. However province government has not issued silvopasture area. because they worried that the communities manage the forests unsustainably.

The government made a policy related silvopasture that cannot be fulfilled by communities living surrounding forest because they need a lot of funds to get a silvopasture permit. Communities have illegally grazed

their livestock in the forest because They have no fund and skill for getting a permit (Kurniadi, 2017).

Government are seeking a strategies to involved communities in managing forest. They will involve communities in silvopasture management. Interest of government is forest sustainability and interest of communities is income. Government hope communities fulfill interest of government forest if government involve communities in state forest management.

Principal-agent Problems

Communities are not willing to plant trees

Indonesia government will involve communities in silvopasture management. Relationship between government and communities is principal agent relationship. The principal-agent relationship means that one person or some persons (principals) entrust others (agents) to act according to the principals' interests and grant the agents some rights (Guo and Tang, 2015). Indonesia government, as principal, entrusts communities, as agent, to manage state forest. Moreover, Indonesia government grant communities some rights i.e. communities can graze their livestock in the state forest

and get income from livestock. Principal agent problems occur when communities act in the way contrary to interest of government.

Part area of forest in Timor island are pasture and government want to improve quality of forest. Meanwhile, government will involve communities to generate income of communities. Government hope communities planting trees and pastures are converted into a forest. Government will grant communities a right for managing state forest and give communities an obligation to plant trees and keep forest. The success of government program depend on communities behavior, as agent.

Government, as owner of state forest, preserve forest to provide people ecosystem service such as water purification, air quality, space for recreation and climate mitigation and adaptation. Meanwhile, government will involve communities to generate income of communities. Government will provide communities some silvopasture area but they worried whether communities don't preserve forest if government involve communities in silvopasture management.

Principal agent problems occur when community act not according the principal interest. The problems lead government fail to improve forest condition. Communities get income from silvopasture activities although they can not fulfill interest of government.

Planting trees is duty of community if government grant communities a right for managing state forest. The research (Table 1) showed that most communities are not willing to plant trees if government grant communities a right for managing forest. Therefore, government can not improve forest quality. Communities, as agent, will act in a way that is contrary to the best interests of government, as the principal.

The principal-agent problem arises

when this relationship involves both misaligned incentives and information asymmetry (Shah, 2015). However, based the research, government know that communities, as agent, are not willing to plant trees and can not fulfill interest of government and principal agent problem occurs if government grant communities right to manage state forest as silvopasture area. Government must anticipate principal-agent problem.

Recently the forests are degraded and changed into pasture and government will involve communities in forest management. Government want communities planting trees in the forest to improve forest quality. However the research showed that most communities are not willing to plant trees in the forest. Community will not fulfill interest of government and principal-agent problems with moral hazard occur if government give communities a permit for managing forest. Government must seek strategies to control communities if they involve communities in managing state forest.

Government must have mechanism to prevent principal agent problem with moral hazard if government give communities a license for managing forest. Based the research, most communities are not willing to plant trees so government must lead communities planting trees and control communities.

Government, as principal, will contract with communities, as agent, to manage state forest. Thus, the difficulty in achieving a contractual resolution of the moral hazard problem arises because the principal cannot directly observe the agent's action, and therefore, cannot directly control the agent's action via a contract with payoffs contingent on the agent's action (Page, 1991). Government cannot control communities action via contract so principal-agent problem occurs.

Table 1. Willingness of communities to plant trees

No	Willingness of people	Frequency	Percent
1	Respondent are willing to plant trees	1	5,6
2	Respondent aren't willing to plant trees	17	94,4
	Total	18	100,0

The “moral hazard” refers that principals can impossibly monitor all behaviors of agents due to asymmetric information; thus, in case that difference exists between the interests of the agent and the principal, agents may do behaviors that adversely affect the agents from the view of their own interests (Guo and Tang, 2015). Based our research, government has information that most communities are willing to plant trees in the forest. Therefore, government must encourage communities to plant trees.

In most circumstances, the principal may acquire additional information on the agent’s action beyond that revealed by the outcome (Jost, 1991). Our research showed that principal have information about agent’s behavior before principal contract with agent’s. Based the research, principal know that most communities are not willing to plant trees in the forest. Therefore, government must anticipate behavior of communities to get interest of government.

Incentive can be used to motivate agent to perform as principal would prefer, taking into account the difficulties in monitoring the agent’s activities (Laffont and Martimort, 2009). Principal has an information that most communities are willing not plant trees. Government, as principal, must motivate communities, as agent, to perform as principal would prefer. Government may give communities incentive to plant trees.

The central concern of incentives is how the principal can best motivate the agent to perform as the principal would prefer, taking into account the difficulties in monitoring the agent’s activities (Sappington, 1991). The research showed that most communities are not willing to plant trees so government must give communities an incentive to motivate communities so they are willing to plant trees.

Communities are not willing to keep forest

Government will involve communities in managing state forest. However, the forest will be degraded if communities are not willing to keep forest. Government and communities must keep forest to receive interest of government. Government give communities a job to keep forest if government contract with communities as agent to manage forest as a silvopasture area.

Keeping forest is a duty of communities if government give community a right for managing state forest. The research showed that most communities want to use forest as grazing area but they are not willing to keep forest. They argue that keeping forest are job of government.

Forest will be degraded if most community are not willing to keep forest. Meanwhile, government will involve community in managing state forest and give communities a permit to manage state forest. Besides, they give communities an obligation to keep forest. Principal agent problems with moral hazard occur because communities were not willing to keep forest.

Forests used communities for grazing are degraded because of encroachment and fire. Government as principal want communities keeping forest from encroachment and fire. However, based the research, most communities are not willing to keep forest so government must control communities keeping forest if government grant communities rights for managing state forest.

Government needs cost to prevent principal agent problem with moral hazard and to control community so they act according to interest of government (van Kooten, 2017). Principal agent problems with moral hazard occur when communities act cont-

Table 2. Willingness of communities to keep forest

No	Willingness of people to keep forest	Number of respondent	Percent
1	Respondent are willing to plant trees	1	5,6
2	Respondent aren’t willing to plant trees	17	94,4
Total		18	100,0

rary with interest of government. Government needs to control communities so they are willing to keep forest.

There are problems with allowance for managing forest. Communities are not willing to plant trees and silviculture is not viewed as an investment because the agent has no right to the future timber benefits (Bogle and van Kooten, 2013). Communities argue that they don't get profits if they plant trees and keep forest.

Communities living surrounding forest used forest for agricultural purpose and they change forest into agricultural area so forests are degraded and changed into pasture area. Besides, forest encroachment and fire drive degraded forest. Government needs communities to keep forest. Government must motivate communities to keep forest so government can preserve forest from forest encroachment and fire.

Communities view that they don't get benefit if they keep forest. Communities are willing to keep forest if benefits of silvopasture are higher than cost of silvopasture. Communities have to cover cost of keeping forest that cause benefit of silvopasture profit decrease. Government must give communities an incentives for keeping forest.

The principal typically prefers informed to uninformed agents, whether the agent receives the information before or after contracting. This result is false when there are more than two outcomes (Sobel, 1993). The research showed that the principal receive information before contract. They know that most communities are not willing to keep forest. Principal-agent problem will occur if government contract with communities. Government must motivate communities so that they are willing to keep forest.

Government will contract with communities for managing state forest for sil-

vopasture purpose. However, the research (Table 3) showed that communities don't understand the contract related silvopasture management. Communities just sign a contract and they don't know what is contract and what must they do if they sign a contract. Communities are not accustomed to carrying out the agreements. Table 3 showed that most communities don't understand the contract.

Principal agent problems will occur because communities don't understand contract. Communities will not carry out the agreement stated in the contract and they manage forest not according to interest of government. Government must explain communities the contract and obligation of community if government give communities right to manage forest.

A contract is a legally binding agreement that recognizes and governs the rights and duties of the parties to the agreement. A silvopasture contract contains rights and duties of communities and government (Page, 1991). Duties of communities are to keep forest and to plant trees that stated in a silvopasture contract. Right of communities are they can graze livestock in forest and they get income from silvopasture activities. Government and community must act according to the contract to prevent principal-agent problem.

Government will contract with communities to manage state forest but most communities don't understand contract and they are not willing to contract with government. Communities prefer to graze illegally their livestock in the forest and act on the way contrary to interest of government because they don't understand contract.

Education level and employment influence communities understanding of contract. Most of communities don't understand contract because most communi-

Table 3. Respondent understanding of contract

No	Respondent understanding of contract	Number of Respondent	Percent
1	Totally understand	1	5,6
2	Partially understand	0	0,0
3	Don't understand	17	95,4
	Total	18	100,0

ties were low education. Government must increase level of education so communities understand the contract. Moreover government have to explain contract and what needs to be done if government contracts with communities for managing forest.

The research showed that there are principal-agent problems if government involve communities in silvopasture management. Government must control communities to comply with the contract and explain communities the contract so community understand contract. Moreover government must punish communities if communities act contrary with the contract.

Contracts relating to the use of forestland are particularly difficult to enforce because of asymmetric information and the principal-agent problem. The agent has information that is unavailable to the principal and the agent often acts in ways hidden from and contrary to the desires of the principal (van Kooten, 2017). The research showed that communities doesn't understand contract and government can not use contract to control communities. They may act in way hidden from and contrary to desires of the principal because they don't understand the contact.

The research showed that government has information that communities don't understand contract and this leads a principal-agent problem. Government can prevent principal-agent problems based on this information. The government may not contract with communities to prevent principal-agent problems or government seek some strategies to prevent principal-agent problems.

A principal-agent problem delays successful contracting (van Kooten, 2017). Meanwhile, the result showed that most communities don't understand contract and lead a problem successful contracting. Government must control communities to success the contact. However, the process of monitoring communities activities associated with forestry is complex and costly, and the process is subject to asymmetric information, perverse incentives and inadequate

institutions (van Kooten, 2017).

Mediating interests of local people

The research showed that interests of local people are different from interest of Government. Communities are not willing to plant trees and keep forest if government give communities a permit for silvopasture in state forest. Mediating interest local people are needed to change people's behavior so government and local people sustain state forest.

The mediation has played an important role in facilitating the process of conflict transformation (Dhiaulhaq *et al*, 2014). Local communities and government have a conflict in use of forest. Government will give local people a permit for silvopasture purpose in state forest but local people are not willing to plant forest and keep the forest so government will not sustain the forest. Mediation can solve conflict between government and local people.

Communities graze illegally their livestock in state forest in East Nusa Tenggara Province Indonesia. Government will give local communities a permit for silvopasture in state forest so local people graze legally their livestock. However government must mediate local people so they are willing to plant trees in the forest and keep the forest. The mediation can prevent principal-agent problem in silvopasture contract between government and communities.

CONCLUSION

Indonesia government curb illegal grazing through giving local people a permit to manage state forest and involve communities in managing state forest for silvopasture purpose but there are principal agent problems with moral hazard if government give communities a permit for silvopasture management, such as most communities are not willing to plant trees and to keep the forest. Government may mediate communities to plant trees and keep forest so government can prevent principal-agent problems in silvopasture contract.

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